Questions to Mr Jos Dings, Executive Director, Transport & Environment

EMIS hearing on 4 July 2016

1. T&E is a member of the working group motor vehicles (EO 1295) of the Commission. How does T&E judge the balance of the different interest groups in this working group? How many of T&E's staff members are present there? Have you got the impression, that T&E's concerns are heard by the Commission?

The Working Group Motor Vehicles is actually not so much a working group but more a group where the Automotive unit of the Commission's DG GROW reports back on activities and progress in the various work areas. It is not a decision-making body, it is a platform for high-level information exchange on ongoing topics.

T&E does participate in numerous technical working groups that do the technical preparation of regulatory and implementing acts. These include:

- RDE (DG GROW);
- WLTP (DG GROW), actually 3 groups;
- VECTO (DG GROW);
- Expert group low carbon vehicles (CLIMA), incl. the subgroup of eco-innovations; and correlation working group
- GEME (Group of Experts on Emissions of Mobile Machinery Emissions) DG GROW;
- Sustainable Transport Forum (DG MOVE) and various subgroups;
- GEAR2030, CARS2020, CARS21

In addition, we attend UN-ECE Geneva-based working groups notably on WLTP.

The balance of interests is always the same: T&E is vastly outnumbered by the representatives of the industry concerned. Numbers matter since group dynamics typically do not allow individuals to take up disproportionate speaking time and amount of interventions. T&E typically has one technical expert per topic (often a consultant) with policy support. Sometimes we can send no-one to meetings because of other commitments or funding constraints, sometimes we can send one person, occasionally two. In addition there is inherent bias as industry has data others don't have, and often presents it selectively to skew arguments. This is not just a problem for T&E, it is also for decisionmakers and can only be resolved with additional resources for independent expertise.

That said, our arguments tend not to be ignored, and we can have some influence in the groups in which we participate.

T&E's cars team is 3.5 full time equivalent staff. In the last 3 years we have exposed more of the issues with testing on first CO2 and, more recently, NOx. We have devoted more and more resources to these issues including participating in groups developing new test procedures. Ten years ago T&E had only one staff for car-related issues so inevitably we had no choice but to skip the vast majority of regulatory meetings and activities. Efforts were therefore focused on high-level policy with a greater emphasis on CO2 for which there was no regulation until 2009. Recently air pollution issues have again taken a greater priority.

2. How does T&E assess the future of the Diesel engine? Has it reached its technical potential or is there more to achieve in the future in terms of fuel efficiency and less emissions? What would be the next technical hurdles? Does T&E consider diesel technology still to be effective tool to achieve the key targets of EU climate framework, in particular the reduction of the CO2 emissions? Is the diesel technology still economically profitable after the introduction of RDE testing cycles, or will the diesel become too expensive because of more and more complex emission control, so that it will be replaced by other technologies?

It is not our role to judge where exactly the end lies of the diesel engine and how profitable it will remain for carmakers. However, the latest technical analysis demonstrates that a 70 g/km fleet average CO2 emissions level (based upon the NEDC test) can still be met with an almost exclusively internal-combustion based fleet - with a significant share of hybrids. If carmakers decide, for example, to reduce the power of their vehicles, enabling

further engine downsizing, CO2 from internal-combustion based cars can be lowered further.

We have never shared the view that diesel technology is essential in reaching CO2 targets, or that a diesel car is better for the climate than a petrol car.

First, a diesel engine is €2,000 more expensive than a regular petrol engine with comparable specifications; that €2,000 delivers typically 10-15% lower CO2 at the tailpipe. Investing the same €2,000 in a petrol engine to bring down its CO2 enables full hybridisation, delivering at least 25% savings. In other words, diesel engines are a costly way of cutting CO2 - even apart from the air quality consequences.

The only reason European's buy diesel cars in large numbers is due to tax and regulatory bias. On average diesel tax in Europe is 30% below the petrol tax. This lower fuel tax stimulates purchase of larger vehicles and driving more kilometres, a second reason why diesel cars do not necessarily lower CO2, and this policy is most definitely not technology neutral. Furthermore, diesel engines are allowed to emit much higher levels of NOx than gasoline engines lowering the costs of manufacture - again not technology neutral.

Thirdly, lifecycle analysis shows that diesel fuel requires more energy to refine and diesel engines have higher embedded energy because of their higher weight and complexity, further eroding CO2 benefits.

Fourthly, NOx and PM, contribute directly or indirectly to climate change too - this is especially a concern when diesel particle filters do not work or are removed, which is certainly not rare.

Fifthly, added biofuels are decidedly worse for the environment for diesel than those for gasoline vehicles. Three quarters of biofuels Europe uses is biodiesel made of vegetable oil, which has been convincingly demonstrated to be worse for the climate than fossil diesel.

Sixthly, European carmaker's focus on diesel development has for decades drained R&D resources away from more promising avenues for deep decarbonisation of vehicles, notably hybridisation and electrification. This is not just an environmental concern. Just 1 in 20 cars new cars sold outside

Europe is a diesel and after dieselgate this share is more likely to go down than up. There are significant risks to competitiveness of the industry for Europe to remain a diesel island in a stagnant market, in a world of growing markets for petrol, hybrid and electric cars.

If policy biases mentioned above stay in place, diesel technology will likely remain economically competitive in many market segments even after the introduction of RDE. In most instances the advanced aftertreatment systems only cost a few hundred euros. However, the share of diesel in the small family car (Golf) but especially city car (Smart) and supermini (Polo) segments will undoubtedly decline. We however think that without further action the overall market share of diesel will decline only slowly over the next few years. As technology evolves and batteries become better, lighter and cheaper there will be more gasoline direct injection and gasoline hybrid models and an increasing number of plug-in and full electric vehicles but the rate at which market penetration and associated cost reductions will happen will strongly depend on timing and strictness of CO2 and zero-emission legislation for cars post-2021. It is of paramount importance that new legislation takes effect in 2025 at the latest in order to make up for the slow progress to date.

3. Currently the European Parliament is working on a Commission proposal for the reform of the Type Approval regime. What is T&E's assessment of this proposal? Does it, in your view, address and correct the failures of the type approval system currently in place?

The Commission proposal on the new Type-Approval Framework Regulation, presented earlier this year in response to the dieselgate scandal is certainly a good start as it addresses some of the current failures of vehicle testing in the EU. Three new reforms stand out:

1. First and foremost, necessary power for the European Commission to check vehicles on the road in its state-of-the-art JRC laboratories in Ispra, Italy. This is a currently lacking and urgently needed independent verification of vehicles' compliance, with, crucially, ensuing powers to order recalls and levy fines;
2. Good provisions on the accreditation, designation, and quality control of testing services. We particularly appreciate the proposed regular joint audits by two Member States and the Commission;
3. Increased transparency with better information sharing between the national type-approval authorities and the Commission. Today's system is shrouded in secrecy whereby no one knows which vehicle was certified where.

However, the glaring weakness in the proposal is that it does not adequately address the underlying cause of the current emissions scandal in Europe - that national testing authorities (TAA's) are compromised and lack independence and accountability. Too many perform their duties either in a way to protect national industry interests and / or to earn fees from carmakers.

While there is one law and one strong authorities to implement this law in the US; in Europe 28 member states regulators generally apply minimum implementation to the 2007 Directive. Carmakers can, and do, shop around the EU for the most attractive service. National regulators of carmakers use this as an opportunity to provide a form of industrial support by failing to adequately scrutinise claims. Other TAA's must compete for business and do so by also offering minimal oversight or quality checks. Financial links are obscure. In the absence of a truly independent EU Type-Approval authority (in our view the best solution but deemed politically unfeasible), rigorous EU oversight to control the work of national regulators has to be introduced. This can be done by auditing their work, spot checking a few type-approvals issued, and sanctioning those found of mismanagement, e.g. by removing their right to issue EU type-approvals.

Another area that needs strengthening is that of market surveillance. The Commission proposal does make it mandatory on the national authorities (this is completely in the hands of the industry today without any independent on-road tests carried out), but stops short of more consistent and rigorous provisions. A clear pan-EU goal to test around 25% of all new vehicles on the road should be set, supported by clear risk-based selection criteria as in the US. This should be funded by an EU administrative charge: carmakers should pay for instance €10 on each new vehicle sold into a fund. The US in-use testing programme costs the US EPA around $20m (around €15m) per year, which is a small amount of money to ensure cars on Europe's roads are clean and compliant with the existing rules. Europe will require more funds as it needs to ensure the work of the 28 TAA's is consistent.

In short, the future type-approval system must be: independent, rigorous and resourced, transparent and consistent. All actors in the Single Market should have power to enforce the rules while vehicles should be tested throughout their lifetime for compliance.

4. According to the statements by the European Commission in one of the EMIS hearings, the Commission never attempted, despite growing evidence, to introduce the topic of possible use of defeat devices by European manufacturers at the level of the TCMV or TAAEG. Was this topic ever discussed in the CARS21 group? Has any other participating party tried to introduce such topic into discussion?

The issue of defeat devices did not feature highly in discussions in the CARS21 Group or the subsequent Cars 2020 action plan. Language on defeat

devices was included in Euro 5 and 6 legislation adopted in 2007 which became fully effective in 2010.

T&E could live with the text of the Draft Final Cars 21 report of May 2012 and did not propose changes. The report made reference to a 2010 JRC report that showed problems with real world testing but the text does not explicitly refer to defeat devices. It discusses the creation of an RDE group to develop new test procedures that was due to report at the end of 2012 (and actually is still working on Phase 3 and will start work on Phase 4 next year). The CARS21 report comments that

"The emission reductions achieved by introducing tighter standards have, at least partially, been offset by higher transport volumes as well as higher shares of diesel cars (in particular for NO_x) and less than expected reductions of on-road "real driving emissions".

Following the requirements of the EURO 5/6 Regulation (EC) 715/2007, the Commission (JRC) has performed a study on the real driving emissions of Euro 5 vehicles in 2010[1]. One of the findings was that real driving emissions, in particular NO_x emissions of EURO 5 diesel vehicles, significantly exceed regulatory emission limits, by a factor of 2 – 4 for entire test routes (covering a distance of up to 120 km) and even more for a single cycle. These findings are supported by several other studies performed in Member States, e.g. UK and NL.

….. For light-duty vehicles, test procedures for controlling "real driving emissions of light duty vehicles" (RDE-LDV) are being developed by the JRC with the support of a RDE-LDV working group composed of stakeholder experts. The group has been established in January 2011 and should deliver draft procedures by the end of 2012, with a view to apply the resulting test procedures from the mandatory EURO 6 dates.

At this stage no decision had been taken whether to use Portable Emission Measurement System (PEMS) or not. Industry strongly opposed such an approach preferring the alternative 'random cycles' approach (performed in laboratories) derived from the EU-WLTP driving data collection.

The CARS2020 Action Plan was published in December 2012. It was focused on dealing with the economic crisis and our responses largely focused on preventing delays to regulation following Commissioner Tajani's unilateral announcement of a 'regulatory moratorium'. The paper refers to finalising test methods by the end of 2014 and transitional arrangements to apply from 2014 to 2017 – for both CO2 and pollutants. This timetable was not met and the transitional arrangements become a reporting scheme that commenced in January 2016.

T&E had produced an early study on test manipulation in 1998 - following scandals involving defeat devices in the US. In 2013 we published our first 'Mind the Gap' report highlighting the way carmakers manipulated CO2 tests and presenting test results. We took care in this report to discuss "manipulation" to describe the practices as at this stage it was unclear whether these were illegal. We only referred to carmakers "cheating

customers" by providing inaccurate information.

This early work did not focus on NOx emissions - primarily because at the time the main issue with high diesel NOx emissions was believed to be the obsolete NEDC test and weak procedures that manufacturers abused to produce artificially low test results. This was being addressed through introducing RDE tests and was where T&E vehicles team focused its efforts. At the time there were a number of pressing issues including getting a new WLTP test introduced; securing a good outcome to the 2020 car CO2 regulation; and on reducing particulate emissions from Non-Road Mobile Machinery (as particulate matter was the pollutant of greatest health concern). The vehicles team at T&E simply did not focus on the diesel NOx questions until 2015. We were aware of suspicions about the use of defeat devices for both lowering CO2 and NOx emissions there was no definitive evidence and we had no means to detect or prove such cheating.

6. In your briefing from July 2015 entitled "Realistic real-world driving emissions tests: the last chance for diesel cars?" (https://www.transportenvironment.org/sites/te/files/publications/2015%2007%20RDE%20position%20paper%20FINAL.pdf) you quote the "Impact assessment accompanying a revised EU Strategy on Air Pollution" and its conclusion that "air pollution causes substantial environment and health impacts: in 2010 annual premature mortalities amounted to over 400,000". Based on this general observation, you deduce in the briefing that "the primary cause is diesel vehicle pollution and the failed system of Euro standards which has not delivered the anticipated improvement in real world emissions as a result of carmakers circumventing the obsolete system of testing to enable them to fit ineffective, cheaper exhaust treatment systems to cars" (page 4). Are you aware that the Commission referred to the overall air pollution, this mean not only the one caused by car emissions? Can you prove how many of the 400,000 premature mortalities were caused by the diesel vehicle pollution and the failed system of Euro standards? If not, how did you come to the conclusion that these two aspects are the primary cause? If not, are you aware that you interfere into the principle of technological neutrality, in order to push for your own political goals?

Yes we are aware that road transport is not the only contributor; that is why we used the word 'primary'. We quote the EEA's last report on air pollution in Europe.

"The estimated number of premature deaths in EU-28 attributed to PM2.5, NO2 and O3 exposure are 403 000, 72 000, and 16 000, respectively".

"As is the case for PM, the contribution from the different emission sources and sectors to ambient air concentrations depends not only on the amount

of pollutant emitted, but also on the emission conditions (e.g. emission height). The transport sector contributed the highest share of NOx emissions (46% in the EU-28) in 2013, followed by the energy and industry sectors (see Section 2.3). Furthermore, the contribution of the transport sector to ambient NO2 concentrations, especially in urban areas, is considerably higher, owing to the fact that these are emissions close to the ground and distributed over large areas. The average decrease in annual mean NO2 concentrations measured over all stations in Europe is slower than the decrease in NOx emissions. The main reason for it may be attributed to the increase in the share of NO2 in the NOx emissions from diesel vehicles (Grice et al., 2009; ETC/ACC, 2010).”

The EEA analysis shows the overwhelming number of deaths occur in urban areas and vehicles are the dominant source of air pollution exposure. Diesel vehicles emit much higher levels of NOx and in the past particulates. It is therefore accurate and entirely reasonable to conclude diesel cars are a primary cause.

As the EEA mentions, for PM2.5 the same applies: not only contributions to overall emissions matter, but also location (traffic is closer to people than industry), chemical composition (diesel particles are more harmful than particles of natural origin for instance) and size (diesel particles are very small). On all three counts, diesel engine particles have a higher impact on human health than particles on average. In central London, for example, 80% of PM2.5 emissions comes from road transport.

In brief, estimates of total fatalities from air pollution have gone up, and while we never claimed an absolute number of premature deaths attributable to diesel vehicles, there is more than enough evidence that for PM and NOx, jointly responsible for 475,000 premature deaths, diesel vehicles are the primary cause.

Regarding technology neutrality, our earlier answer demonstrates that the reason for the high share of diesel cars in Europe is a decidedly not-technology neutral policy: lower excise duty and weaker NOx limits than for petrol cars. We would dearly like to see technology neutral policy between petrol and diesel: equal fuel taxes and equal emission standards.

7. Inadequate enforcement of type-approval and market surveillance rules by Member States' authorities is understood to be one of the source of the current situation of the regulatory failure in the enforcement of the EU rules as regards EURO 5 and 6 emission standards in case of type approval of new vehicles. Would you support the view there are different interpretation of type-approval rules done by technical services depending to which Member State they issue the type-approval? According to your view, in the situation of EU harmonized rules, what are the grey areas where different

interpretation of rules exists?

The lack of national enforcement and divergent interpretation of the current type-approval framework directive lie at the heart of the current failure to meet air pollutant and CO2 emission standards on the road. Nothing can illustrate this better than the recent statement of the German Transport Ministers that the EU Transport Council on 7 June 2016, saying that the *industry* is interpreting the EU defeat device legislation in different ways; the job that should be done by the national regulators instead.

Grey areas include:

- Selection of vehicles for testing - the absence of detailed provisions on what is and is not allowed in terms of "representative vehicles" is a widely abused loophole. Carmakers preparing so-called "Golden Vehicles" which bear little resemblance to those driven on the road and give much more favourable results. An overarching obligation must be placed on TAA's to ensure that the vehicles that are selected for type-approval testing would not lead to systematically lower/different results on the road.
- Today TAA's often require different accreditation and quality controls as well as different levels of engagement into type-approval and conformity of productions testing from testing services because the framework directive doesn't harmonise such rules. First, strict accreditation, designation and audit requirements are necessary which should be mandatory on all TS, whether owned by OEMs, public or private. Second, there must be a clear provision for EU whole vehicle type-approval tests to be carried out in independent TS labs whereby TS execute the test and have access to all the testing specifications necessary, not mere witness testing as is often the case today.
- An important loophole exists in the national enforcement of the defeat device ban, as stipulated in article 5.2 of Regulation 715/2007/EC. The exemptions from the ban allowed, e.g. to protect the engine, are open to a wide interpretation by the national authorities and there is no clear provisions on whose burden of proof it is to justify that the exemptions are necessary. The latest revelations from the national investigations in Germany, UK and France serve to prove this point: while there is a clear ban on defeat devices and clearly defined exemptions (same wording as in the US) in EU legislation, its enforcement and application is different and utterly inadequate at the national level. Carmakers are allowed to switch off their pollution control technologies in temperatures ranging from anything below 17C (some at 17, some at 10 and some at 5 - no consistency or level playing field among TAA's) and in various driving conditions that slightly vary from the prescribed test cycle (e.g. speeds, altitudes, engine loads, etc). Absolutely no scrutiny is given to how carmakers are (ab)using the derogations from the defeat device ban. This is in stark contrast to the US, where - based on the exactly same rules - US EPA only allows reduction in emission control at temperatures below minus 3C, for example (for heavy duty vehicles).

In the absence of one strong EU regulator, this needs further tightening to ensure all 28 TAA's follow the same procedure on defeat devices. First, OEMs must be required to disclose any exemptions used and provide clear engineering justifications for their use. Second, TAA's (and JRC) must have clear power to verify the justifications, require further explanations if necessary and approve or reject them. Third and similarly to the US, the Commission should provide clear technical guidelines based on which TAA's should approve the use of defeat devices, including ambient temperatures and engine parameters at which the use of exemptions is allowed; this must be based on best available technology and not tolerate use of inferior designs and materials.

In the absence of one rigorous EU Type-Approval Agency, the only way to avoid such different interpretations and ensure consistency is to 1. agree the new Regulation in the most stringent manner so as not to allow any divergence in application 2. put in place strict oversight over the work on national TAA's to rigorously check their enforcement, and 3. independently check vehicles once they are on the road, by a different TS from that issuing the original type-approval so that any misconduct or non-compliance can be caught.

8. How would you compare the approach to automotive industry regulation by the Commission around 2005 and adoption of the Euro5/6 Regulation, and around 2010 at the time of re-establishment of CARS21 High Level Group? What about more recently as regards the regulatory decisions on RDE after the VW gate?

We prefer not to call the affair 'VW-gate' but rather #Dieselgate since VW has been shown to be one of many manufacturers using highly questionable and probably illegal emission control strategies that could easily be categorised as defeat devices.

In the US, the design and enforcement of air pollution and climate standards is done by the same department that is responsible for achieving air quality and climate targets (EPA). In Europe responsibilities are mostly split: the environment and climate (ENVI and CLIMA) directorates of the Commission are responsible for air quality and greenhouse gas emissions, whereas the industry department (GROW) is in charge of type approval and setting testing procedures and most standards (with the notable exception of CO2 emissions from cars and vans). This on occasions has lead to conflict and frustration as the exchanges between ENV and GROW in the past show. In no way this is meant to question the spirit and competence of the staff of the automotive unit at DG GROW - it is simply a political accountability issue.

As for CARS21, CARS2020 and GEAR2030 - while these groups did set strategic direction to an extent, it must be said that they are non-legislative and that vital decisions on key issues, such as on the Euro standards, CO2 standards et cetera, were entirely taken outside of these fora. The operation of

the Groups has been progressively democratised. Originally The Automotive Unit would hold bilateral discussions with ACEA to discuss policy developments. During the Cars21 and Cars2020 processes other stakeholders were involved. With Gear 2030 there was an open competition to participate in the Group - this evolution is welcomed.

Commissioner Verheugen simply chose to leave T&E - as well as our safety counterparts ETSC - out of the first iteration of the CARS21 process he launched in 2005. The focus of CARS21 was globalisation of standards in particular through UN-ECE Working Party 29. While this has led to removing unnecessary double regulation in some areas, in general we did, and do, not support this move because of the very low levels of scrutiny, transparency and accountability of UN-ECE compared with the (admittedly imperfect) EU decision making process. The EU proposal in the TTIP Automotive Chapter continues this pattern placing more emphasis on the role of the UN-ECE.

Commissioner Verheugen was widely reported to oppose the transition towards legally binding CO2 standards that the Commission proposed late 2007 and supported the call of the automotive industry to lower the original 120 g/km CO2 target for cars to be met in 2012 to 130 g/km. We have (unofficial) minutes of CARS21 meetings in which he argues that 120 g/km CO2 is 'technically impossible' (note: the industry reached 119 g/km CO2 in 2015).

As for Euro 5 and 6, we consistently argued in a 2006 position paper, for technology- and fuel-neutral standards and for alignment with the US, where tougher standards apply. We also wrote '*The proposal should be amended to contain provisions on 'not-to-exceed' values for NOx and PM (in line with provisions for lorry engines) in order to rectify the current practice of cars being just optimised for the test cycle*'. '*A thorough overhaul of the regulatory strategy for emissions control should be announced, in particular in-use compliance monitoring, now reports of chiptuning and other cycle-beating practices are becoming ever-more frequent*.'

We know the proposal and the end result - the Commission, Member States and Parliament chose a different path and proposed standards that were much laxer for diesel than for petrol engines.

Commissioner Tajani invited us, together with the European Transport Safety Council, to take part in the new iteration of CARS21, called CARS2020. In 2012 Tajani announced a 'regulatory moratorium', without this ever having been discussed in the group.

As for RDE, the process has dragged on and on, primarily because Member States were always happy to listen to industry demands for further changes and further analyses, and even reversing decisions that had been taken earlier. We are not happy with the outcome especially the excessive

conformity factor. We understand that at the last moment pressure from Member States lead to Commission staff being instructed by the upper echelons to enter into negotiations about conformity factors with member states in order to arrive at consensus instead of force a vote or require the issue to be passed to the Environment Council which would likely have led to a better outcome. While we believe the Commission made a process mistake, the principal responsibility for the substance of the decision lies with Member States.

The new Commission is very different from its predecessors. At a high level there has been a focus on 'Better Regulation' that in many areas has been abused as a push for deregulation. Gradually the Commission has at the highest level lost the political will to 'lead' and inevitably this trickles down to the working level. This approach has led to delays in proposals e.g. in the area of CO2 as well as the General Safety Regulation, another key piece of legislation for road safety as well as the environment, that lacks any sense of urgency.

The lack of EU-level leadership born out of resistance of Member States, has in our view led to a dangerous situation where 'made in Europe' technology as well as regulations are not the export products they were in the past. We are convinced this is a lose-lose situation for the environment as well as the industry. We hope the UK Brexit referendum leads to a reflection on the side of industry as well as member states; for decades both have been complaining about 'red tape from Brussels' and should not be surprised that voters want to throw it out - taking the internal market with it.

The Commission has proceeded though with technical files like the RDE test and the WLTP test, as well as the Type Approval Framework Regulation, albeit the latter only after dieselgate broke. T&E has a constructive working relationship with DG Grow at a services (automotive unit) and political level although we, nor members of theGreen10, were never granted a meeting with the Commissioner herself. There was not much of a relation under Commissioner Verheugen; and whilst at a services level cooperation was acceptable under Commissioner Tajani, at a political level we never felt our views made much of an impact.

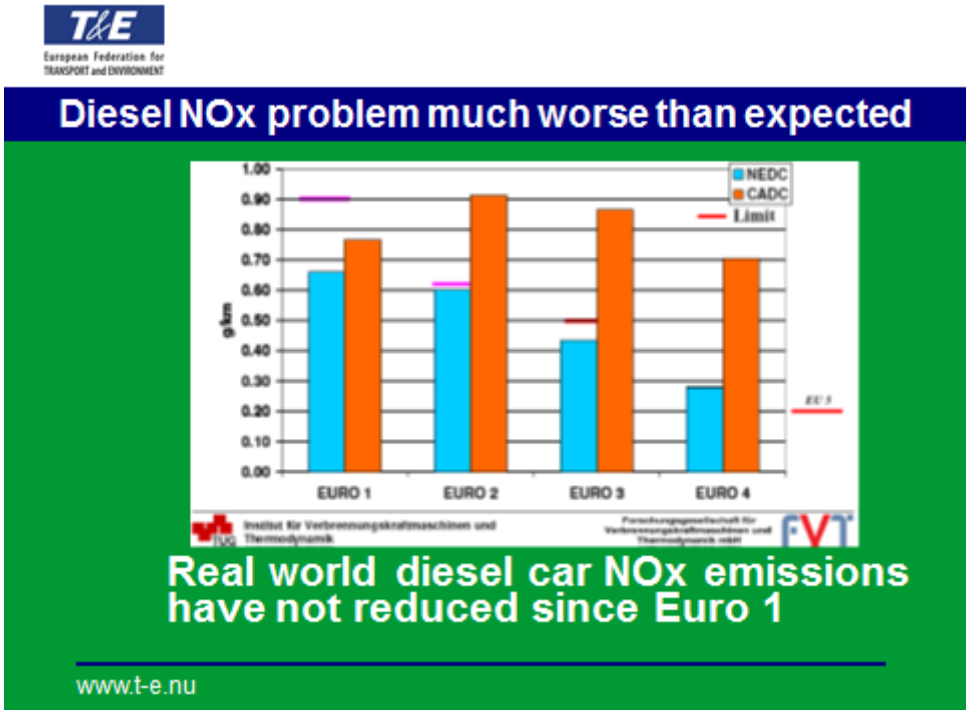
Euro 6 legislation on defeat devices is not perfect, but we feel the principal problem is with implementation and enforcement (responsibility of member states).

9. Since when has T&E been aware of the discrepancy of the vehicle performance in normal use, i.e. real world driving, compared to the regulatory pollutant limits, in particular as regards NOx? Has T&E suspected use of defeat devices? If yes, was this communicated to the Commission or to the Member States' authorities?

In our 2006 position paper we wrote '*The proposal should be amended to contain provisions on 'not-to-exceed' values for NOx and PM (in line with*

provisions for lorry engines) in order to rectify the current practice of cars being just optimised for the test cycle'. '*A thorough overhaul of the regulatory strategy for emissions control should be announced, in particular in-use compliance monitoring, now reports of chiptuning and other cycle-beating practices are becoming ever-more frequent*.'

A slide of a 2006 presentation on the subject is below. Note that the slide dates from an era five years before the first deployment of PEMs; CADC is a laboratory test cycle.



On the issue of defeat devices: it is rather tricky to accuse an industry of illegal behaviour without watertight proof. Even now, with so much evidence on thermal windows, hot restarts, and plain shut-offs, national authorities refuse to admit that this amounts to a defeat device. With the exception of VW the recalls that are underway arising inappropriate use of the thermal window are voluntary. The UK has not yet taken action on any vehicle its

TAA the Vehicle Certification Agency has approved. We believe the exemption on defeat devices is being illegally abused but proving this definitively is difficult.

Over the years, our language has become stronger. In 2006 we spoke about 'optimisation' of vehicles for test results, around 2011 we shifted towards manipulation, around 2013 to 'cheating customers' and only in 2015, on our report 'Don't breathe here', issued some 10 days before dieselgate, we began to directly refer to defeat devices in the area of NOx when we had collected evidence on 23 Euro 6 diesel vehicles.

Frankly as late as 2013 we still had hopes that the whole Euro 6 package with its various iterations of implementing legislation, existing ban on defeat devices and up-and-coming RDE would be sufficiently convincing for carmakers to end their longstanding practices. We were baffled when test after test on Euro 6 vehicles with new PEMS technology indicated virtually no progress on NOx and the gap between test and real-world moving from typically 200-400% to typically 400-700% and sometimes even higher. This, together with the end of our work on new standards for non-road mobile machinery (focusing on getting particle filters on new diesel machines), which allowed us to focus more on enforcement, eventually led to the 'Don't breathe here' and the associated EP event 12 days before dieselgate broke.

Note that even the US EPA has not proven the existence of a defeat device at VW; the company admitted it after US EPA threatened to withhold vehicle sales. The best actual *proof* of a defeat device we have seen so far is in this video (as of around 50m) that analyses the actual software of a VW engine control unit (ECU) in depth.

Over the past five years we have worked very intensively on the gap between official and real-world CO2 emissions as this is when the gap started to grow rapidly. We put very significant resources into the development of a new test cycle, WLTP, with very direct involvement in the technical working groups and the development of numerous proposals for closing loopholes including at the UN-ECE. We developed with PSA a world-first real-world CO2 testing protocol that the company now uses in its marketing, and we hope can be used as an important input for a future 'not-to-exceed' style future CO2 legislation.

T&E is based in Brussels, and Brussels is responsible for designing and adopting standards, and member states are responsible for enforcement. An important explanation and root cause of dieselgate. This division of competences of EU has also defined the areas of work of T&E and its members.

T&E in Brussels has focused on new emission legislation, including especially in recent years on new legislation to close the gap between paper and real world (WLTP and RDE). We worked very intensively on the development of the RDE NOx testing protocol including participation in the technical

working groups and contributions to proposals.

T&E has also worked on a wide variety of emissions legislation for vehicles for instance:

- CO2 standards for cars and vans;
- Transition towards a new test cycle WLTP;
- Euro 5 and 6, including follow up and RDE;
- Noise standards for cars, vans and trucks;
- Energy, safety and noise standards for tyres;
- Air pollution emissions from non-road mobile machinery

Our members such as Deutsche Umwelthilfe (DUH) have focused on national enforcement, in their case towards Kraftfahrt Bundesamt, as testified in an earlier EP hearing. EU institutions have almost no competence in enforcement. Commission and Parliament can only politely request national authorities to act, and even after dieselgate they have been reluctant as we know. That has to change in the new type approval framework regulation.

10. Since when has T&E been following EU's legislative (EURO standards) and non-legislative (CARS21/2020) processes regarding vehicle NOx emissions? Since when was the problem of "cycle beating" both in trucks and in cars known, to you, within the industry, the Member States and the Commission? Have you recommended measures to address the problem and how do you assess the regulatory response thus far?

We have been following Euro standard setting since the very early days of T&E, probably 1994.

'Cycle beating' is very old. Our first report was from 1998, but the faults identified then were easy to remediate. Until around 2005 it was a bit of a backburner issue, with petrol engine NOx getting under control and diesel engine NOx standards being lax. Our resources to work on air pollution from vehicles were also extremely limited in these days, in fact they remained so until 2013.

The other questions are answered under other headings.

11. According to your last brief titled "Dirty 30', based on the data gathered during the testing programs carried out in Germany, UK and France, it

appears that almost 30% of dirtiest car models has been type approved by UK type approval authority, followed by authorities of Germany and France. The three authorities combined have issued clearance to some 75% of the dirtiest models among those tested. Spain and Italy, where automotive industry is by far more present than UK, have authorized just one model each. Do you have any clue on why automakers might prefer to type approve their vehicles in UK? Is there, to you knowledge, any particular convenience in terms of fees charged, on time for approval or on any other administrative burden?

The Dirty 30 analysis was not a ranking, but rather a selection of 30 of the most polluting Euro 6 vehicles on Europe's roads and. who certified them. We have tried to put together a widespread and representative list based on the data from DE, UK and FR testing programmes (the criteria used was at least 2 times the limit i.e. 160 mg/km on NEDC in slightly different conditions and 5 times i.e. 400 mg/km on RDE). The reason why UK tops the list is because they approve vehicles from a variety of manufacturers, while DE and FR stick to their domestic carmakers. So - to show the pan-industry picture of emission exceedances - this resulted in UK topping the list, but the overarching message is: the main 7 TAA's across Europe certify the most polluting vehicles on our roads and fail to act today to clean those vehicles (that will be used for decades to come). It is also clear that manufacturers often chose to approve cars in the "home" country or where there are significant manufacturing facilities. In any case, approval authorities compete for business, which gives all the perverse incentives for a race to the bottom. In the US, it is not the State of Michigan that is responsible for enforcing laws on the 'Big Three' carmakers; it is the EPA that acts on behalf of the whole territory of the US.

12. On the basis of earlier documents, it appears that the Commission intended to adopt RDE test by 2012 for their implementation at the same time as entry into force of Euro6 limit values (new types 2014/all vehicles 2015). Was the measure and timeline part of the discussions under the CARS21 process?

No date of implementation is included in the Euro 6 legislation, but our understanding is that originally the Commission intended to adopt RDE by 2012. However, the Cars21 report published in December 2011 does not refer to a date and states

"It has to be taken into account that time will be needed to adapt to these new procedures [RDE] and to see their complexity, effects and costs. The completion of open issues in the Euro 6 emission legislation should be done in a timely manner, allowing industry sufficient leadtime. This concern could also be alleviated through a progressive application of the measures. This could be done by starting with relatively high compliance factors, taking out the so-called outlying emitters first, and progressively strengthening of these factors over time."

The Cars 2020 Action Plan published a year later in November 2012 said

"The modalities for the inclusion into the EU legal framework of the new cycle and test procedures should be defined before 2014, including the methodology for correlation of the CO2 targets established on the basis of the old cycle and procedure. For the emission testing, the implementation of the new cycle and procedure should ensure compliance with the Euro 6 limit values under real driving conditions, with appropriate transitional arrangements from 2014 up to 2017."

The Cars 2020 Action Plan therefore revised the timetable for implementation formalising the transitional arrangements. T&E is aware of discussions in the working groups including between DG Enterprise and DG Environment. Given that the Action Plan was not published until the end of 2012, at the time we felt 2014 was an appropriate start date for the transitional arrangements and accepted the text proposed in the Draft Cars 2020 Action Plan as Euro 6 cars were scheduled to be introduced from September 2015. We felt that along with the new RDE test this would clean up diesel. In the end, the RDE discussions with the industry and the Member States took longer and the deadline was delayed by 3 years, to 2017 as was finally agreed in October 2015. In reality Council wanted to "double and delay" RDE limits and succeeded in the Phase 2 RDE negotiations meaning that for all cars the 80mg/km NOx limit won't even apply in 2021. Whilst the cars 2020 Action Plan did outline transitional arrangements; our view is that the more significant delays and weakening of the legislation therefore happened more recently during the negotiations of Phase 2 of RDE in 2015.